

**Health Effects of Indoor Formaldehyde Exposure,**  
M.B. Schenker and S.T. Weiss, Channing Laboratory,  
Harvard Medical School, Boston, Massachusetts  
**Environmental Aspects of Cardiovascular Disease,**  
W.J. Rea, R.E. Smiley, D.E. Sprague, R.T. Edgar, E.J.  
Fenyves, M. Greenberg, and A.R. Johnson,  
Brookhaven Environmental Unit, Dallas, Texas

Morning Parallel Session 9:00 a.m.-12:30 p.m.

## Session C2-Characterization of Aerosols and Inorganic Gases in Indoor Environment

Chairpersons: Morton Lippman, Institute of Environmen-  
tal Medicine, New York University, New York, New York;  
Donald Johnson, Gas Research Institute, Chicago, Ill.

**Effect of Cigarette Smoking on Residential NO<sub>2</sub>  
Levels,** B.W. Good, G. Vilcins, W.R. Harvey, G.T.  
Forrest, A. Clabo, and A.L. Lewis, Research and  
Development, Philip Morris, Inc., Richmond, Virginia

**Indoor-Outdoor Air Quality Comparisons in Ten  
Residential Environments,** S.D. Colome, Program in  
Social Ecology, University of California, Irvine,  
California; J.D. Spengler, and S. McCarthy, Harvard  
School of Public Health, Boston, Massachusetts

**Spatial Variation of Carbon Monoxide and Oxides of  
Nitrogen Concentrations Inside Residences,** D.  
Moschandreas and J. Zabransky, Geomet  
Technologies, Rockville, Maryland

**Pollutant Emission and Source Strengths from Indoor  
Combustion Appliances and Smoking,** J.R. Girman,  
M.G. Apte, and G.W. Traynor, Energy and Environment  
Division, Lawrence Berkeley Laboratory, University of  
California, Berkeley, California

**NO<sub>2</sub> Formation in Range-Top Burners,** R.W. Coutant,  
E.L. Merryman, and A. Levy, Battelle-Columbus  
Laboratories, Columbus, Ohio

**Impact of Residential Wood Combustion Appliances  
on Air Quality,** N.G. Edmisten, K. Lepic and J. Cooper,  
Oregon Graduate Centre, Beaverton, Oregon

**Indoor Carbon Monoxide Pollution in the Netherlands,**  
E. Lebrecht, B. Brunekreef and J.S.M. Boleij, Department  
of Environmental and Tropical Health, Wageningen,  
The Netherlands

**Indoor Aerosol Composition and Sources,** R.G. Draftz,  
Fine Particles Research Section, IIT Research  
Institute, Chicago, Illinois

**Elemental Characterization of Indoor Aerosol Sources  
by Instrumental Neutron Activation Analysis,** S.  
McCarthy, K. Sexton, J.D. Spengler, Harvard School of  
Public Health, Boston, Massachusetts; A.  
Pszenny, Graduate School of Oceanography,  
Narragansett Bay Campus, University of Rhode  
Island, Kingston, Rhode Island

**Experimental Measurements of Aerosol  
Concentrations in Offices,** F.R. Quant, P.A. Nelson,  
and G.J. Sem, TSI Incorporated, St. Paul, Minnesota

**Consistent Measurement of Indoor Airborne  
Particulates,** D.W. Underhill and N. Esmen,  
Department of Industrial Environmental Health  
Sciences, Graduate School of Public Health,  
University of Pittsburgh, Pittsburgh, Pennsylvania

Afternoon Parallel Session 2:00 p.m.-5:30 p.m.

## Session D1-Health Effects of Indoor Pollutants

Chairpersons: M. Lebowitz, University Health  
Sciences Center, The University of Arizona, College of  
Medicine, Tucson, Arizona; J. Stolwijk, Yale University  
School of Medicine, New Haven, Connecticut

**Respiratory Effects of Household Exposures to  
Tobacco Smoke and Gas Cooking,** G.W. Comstock,  
M.B. Meyer, K.J. Helsing and M.S. Tockman, School  
of Hygiene and Public Health, The Johns Hopkins  
University, Baltimore, Maryland

**Pulmonary Functions of Children and Indoor NO<sub>2</sub>  
Concentrations in Portage,** Wisconsin, R. Letz, J.  
Ware, B.G. Ferris, Jr., and J.D. Spengler, Harvard  
School of Public Health, Boston, Massachusetts

**The Effect of Passive Smoking on Pulmonary  
Function in Children,** M. Lebowitz, D. Armet, and R.J.  
Knudson, University of Arizona, College of Medicine,  
Tucson, Arizona

**Effects of Ambient Urban Air Pollution of Asthmatics,**  
F. Silverman, P. Corey, S. Mintz, P. Oliver and R.  
Hossein, The Gage Research Institute, Toronto, Canada

**Health Effects of Radon in Homes: An Analysis of the  
Feasibility of Epidemiological Studies,** S. Rasmussen,  
D. Neuberger, and W. DuMouchel, Massachusetts  
Institute of Technology, Cambridge, Massachusetts

**Lung Cancer and Phosphates,** R.L. Fleischer, General  
Electric Research & Development Center,  
Schenectady, New York

**Airborne Infection,** R.L. Riley, Petersham,  
Massachusetts, Professor Emeritus, The Johns  
Hopkins University, Baltimore, Maryland

**Decreased Pathogenesis During Murine Influenza  
Pneumonia Produced by Infection with UV-Irradiation  
of Airborne Virus,** G.J. Jakab, Department of Environ-  
mental Health Sciences, The Johns Hopkins School  
of Hygiene and Public Health, Baltimore, Maryland

**Amoebae as Sources of Hypersensitivity Pneumonitis,**  
J.L. Sykora, M.H. Karol, G. Keleti and D. Novak,  
Graduate School of Public Health, University of  
Pittsburgh, Pittsburgh, Pennsylvania

**The Adverse Health Effects of Biological Aerosols,  
Other Aerosols, and Micro-Climate Indoors on  
Asthmatics and Non-Asthmatics,** M.D. Lebowitz,  
University Health Sciences Center, The University of  
Arizona, College of Medicine, Tucson, Arizona

**Health and Behavioral Effects of Small Air Ions,**  
Jonathan M. Charry, The Rockefeller University, New  
York, New York

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**The Role of Inhaled Chemical Dusts, Vapours and Fumes in the Production of Asthma**, J. Pepys, MRC Cardiothoracic Institute, Brompton Hospital, London, England

Afternoon Parallel Session— 2:00-5:30 p.m.

## Session D2—Energy Conservation and Indoor Air Quality

**Chairpersons:** Howard Ross, U.S. Department of Energy, Washington, D.C.; David Berg, U.S. Environmental Protection Agency, Washington, D.C.

**Results of the Modular Retrofit Experiment: A Test of the House Doctor Concept**, G. Dutt, D.T. Harje, M. Lavine, G. Linteris, and R. Socolow, Center for Energy and Environmental Studies, Princeton University, Princeton, New Jersey

**Indoor Air Quality in Energy Efficient Homes and Retrofitted Residences**, R.A. Young, J.V. Berk, S.R. Brown, and J. Dillworth, Energy and Environmental Division, Lawrence Berkeley Laboratory, University of California, Berkeley, California

**Indoor Air Quality Audits in Energy Efficient Residences**, J.J. Everett, Environmental Research Division, Sandia National Laboratories, Albuquerque, New Mexico; John Mathur, Engineering Division, U.S. Department of Energy, Washington, D.C.

**Changes in Indoor Climate After Tightening of Apartments**, J. Kørsgaard, University of Aarhus, Aarhus, Denmark

**Analysis of Energy-Efficient Strategies for Increasing Ventilation Rates in Residences**, D. Lord, Building Research Advisory Board, National Research Council, Washington, D.C.

**Performance Measures for Residential Air-to-Air Heat Exchangers**, W.J. Fisk and C.D. Hollowell, Energy and Environment Division, Lawrence Berkeley Laboratory, University of California, Berkeley, California

**Air Quality Control of Ventilation in an Office Building**, O. Seppanen and A. Punntila, EKONO Consulting Engineers, Bellevue, Washington, U.S.A. and Helsinki, Finland

**The Influence of Ventilation on Indoor/Outdoor Air Contaminants in an Office Building**, B. Berglund, I. Johansson, and T. Lindvall, University of Stockholm, Stockholm, Sweden

**Indoor Climate in Low-Ventilated Daycare Institutions**, G.R. Lundqvist, University of Aarhus, Aarhus, Denmark

**Low Infiltration Housing in Rochester, New York: A Study of Air-Exchange Rates and Indoor Air Quality**, F.J. Offermann, C.D. Hollowell, and G.D. Roseme, Lawrence Berkeley Laboratory, University of California, Berkeley, California

**Evaluation of an Air-to-Air Heat Exchanger**, A. Persily, Center for Energy and Environmental Studies, Princeton University, Princeton, New Jersey

**THURSDAY, OCT. 15**

Morning Parallel Session 9:00 a.m.—12:30 p.m.

## Session E1—Ventilation and Controls

**Chairpersons:** James E. Woods, Jr., Iowa State University, Ames, Iowa; Peter R. Warren, Building Research Station, Herfordshire, England

**The Influence of Air Temperature on the Perception of Body Odor**, B. Berg-Munch and P.O. Fanger, Laboratory of Heating and Air Conditioning, Technical University of Denmark, Lyngby, Denmark

**Ventilation and the Control of Occupancy Odor and Tobacco Smoke Odor**, W.S. Cain, B.P. Leaderer, R. Isseroff, and E.D. Lipsitt, Department of Epidemiology and Public Health, John B. Pierce Foundation Laboratory and Yale University School of Medicine, New Haven, Connecticut

**Ventilation Requirements in Occupied Spaces for Control of Total Suspended Particulates and Carbon Monoxide Generated from Tobacco Smoke**, B.P. Leaderer, W.S. Cain, R. Isseroff and L.G. Berglund, Department of Epidemiology and Public Health, John B. Pierce Foundation Laboratory and Yale University School of Medicine, New Haven, Connecticut

**Indoor Air Quality and Minimum Ventilation Rate**, G. Huber and H. Wanner, Department of Hygiene and Applied Physiology, Swiss Federal Institute of Technology, Zurich, Switzerland

**The Effects of Ventilation on Indoor Air Pollution from a Gas-Fired Stove: Tests Results from a Single-Family Dwelling**, G.W. Traynor, V.M. Martin, and E.M. Sterling, Building Ventilation and Indoor Air Quality Program, Energy and Environment Division, Lawrence Berkeley Laboratory, University of California, Berkeley, California

**Kitchen Range Hood and Energy Conservation**, R.M. Kelso, University of Tennessee, Knoxville, Tennessee

**Minimum Acceptable Infiltration Rates for Buildings**, J.P. Monat and R.H. Chin, Walden Division of Abcor, Inc., Wilmington, Massachusetts

**Calculation of Ventilation Requirements in the Case of Intermittent Pollution**, J. Hannay and F. Lorenz, Laboratoires de Physique du Batiment, Faculté des Sciences Appliquées, Université de Liege, Liege, Belgium

**Ventilation for Control of Indoor Air Quality**, J.E. Janssen, J.E. Woods, T.J. Hill and E. Maldonado, Technology Strategy Center, Honeywell Control Systems, Roseville, Minnesota

**Aspects of Efficient Ventilation in Office Rooms**, T. Malmstroem, Division for Heating and Ventilating, Royal Institute of Technology, Stockholm, Sweden

**Building, Ventilation and Indoor Contaminants**, E. Skaret, Division of Heating and Ventilating, The Norwegian Institute of Technology, The University of Trondheim, Trondheim, Norway

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# Symposium Outline

<b>MONDAY, OCTOBER 1-2</b>	
5:00 p.m.-8:30 p.m.	Registration
5:00 p.m.-8:30 p.m.	Reception
<b>TUESDAY, OCTOBER 1-3</b>	
7:30 a.m.-8:30 a.m.	Breakfast for Speakers and Session Chairpersons
9:00 a.m.-12:30 p.m.	Opening Session A: Characterization of the Indoor Environment
2:00 p.m.-5:30 p.m.	Parallel Session B1: Characterization of Radon in the Indoor Environment
	Parallel Session B2: Characterization of Formaldehyde and other Organic Pollutants in the Indoor Environment
5:30 p.m.-7:00 p.m.	Social Hour
<b>WEDNESDAY, OCTOBER 1-4</b>	
7:30 a.m.-8:30 a.m.	Breakfast for Speakers and Session Chairpersons
9:00 a.m.-12:30 p.m.	Parallel Session C1: Health Effects of Indoor Pollutants
	Parallel Session C2: Characterization of Aerosols and Inorganic Gases in the Indoor Environment
2:00 p.m.-5:30 p.m.	Parallel Session D1: Health Effects of Indoor Pollutants
	Parallel Session D2: Energy Conservation and Indoor Air Quality
5:30 p.m.-7:00 p.m.	Social Hour
<b>THURSDAY, OCTOBER 1-5</b>	
7:30 a.m.-8:30 a.m.	Breakfast for Speakers and Session Chairpersons
9:00 a.m.-12:30 p.m.	Parallel Session E1: Ventilation and Controls
	Parallel Session E2: Exposure Studies
12:45 p.m.-2:30 p.m.	Northfield Mountain Power Station ← Box Lunch → Mt. Sugarloaf
2:45 p.m.-6:00 p.m.	Parallel Session F1: Ventilation and Controls
	Parallel Session F2: Models for Indoor Air Quality and Energy Conservation
6:00 p.m.-7:00 p.m.	Social Hour
<b>FRIDAY, OCTOBER 1-6</b>	
7:30 a.m.-8:30 a.m.	Breakfast for Speakers and Session Chairpersons
9:00 a.m.-12:30 p.m.	Session G1: Policy and Regulatory Issues